Supplement 6: Benefits, drawbacks, VC team participants and VC platform used in MDT-Equal and MDTM-Collaborate videoconferencing

<u>Legend</u>

Abbreviations: ENT = Ear-Nose-Throat; FtF = face-to-face, physically; HC = Healthcare professional; MD = Medical Doctor; MDT = Multidisciplinary Team, MDTM = Multidisciplinary Team Meeting; MF = Maxillofacial; pub = publication; RT = Radiotherapy; VC = Videoconferenced-MDTM; * from corresponding author.

VC team participants: <u>MDt</u>: Medical Doctors in therapeutic disciplines: surgeons, (medical) oncologists and radiotherapists; <u>MDd</u>: Medical Doctors in diagnostic disciplines: radiologist, pathologist, nuclear medicine physician; <u>Sd</u>: supportive disciplines related to treatment and palliative care: nurses, dieticians, etc; <u>Other</u>: staff, medical secretaries and medical administration; see supplement 7.

PC Platform abbreviations: CCD = charge-coupled device camera; DICOM = Digital Imaging and Communications in Medicine; DSL = Digital Subscriber Line; EMR = Electronic Medical Record; HW = hardware; ISDN = Integrated Service Digital Network; M / Kbps = Mega / Kilobits per second; PACS = picture archiving & communication system; PC = personal computer; SW = software; TCP / IP = Transmission Control Protocol / Internet Protocol.

** Kunkler's studies used the same VC-Platform; *** Novoa described two MDTMs that use the same VC-Platform.

If authors had not clearly stated the data sources, the text in *italics* is the interpretation made by the authors of this review. Where we could not retrieve information, we put '*Not reported*'.

Authors (pub year)	Benefits VC	Drawbacks VC	Cancer centre participants	Remote partner participants	VC Platform used
MDT-Equal					
Delaney et al. (2004)	<u>Patient</u>: Improved access to multidisciplinary care <u>HC</u>: improved access to multidisciplinary discussions; U-shaped table improved interaction between participants because they then face each other	<u>HC</u>: More formalised and regimented professional relationships of MDs; 1 of the 2 district hospitals did not want to continue because of time constraints	Liverpool Hospital, Sydney*: <u>MDt</u>: oncologist, radiotherapist; <u>MDd</u>: pathologist, radiologist; <u>Other</u>: medical students	2 general district hospitals*: <u>MDt</u>: surgeon, oncologist, radiotherapist	HW: PictureTel Swiftsite-2, PictureTel Venue 2000 and PictureTel Concord 4500 SW: bridge support; bandwidth 384 Kbps Room: U-shaped table
Savage et al. (2007)	<u>Patient</u>: recommendations concerning major or minor changes to treatment plans for complex cases <u>HC</u>: less travel for specialists; served as an educational tool	<u>Patient</u>: less suitable for recruitment for clinical trials and research discussions <u>HC</u>: less suitable for research discussions	Centre, Glasgow*: <u>MDt</u>: ENT-, MF-surgeons, oncologists; <u>MDd</u>: radiologists, pathologists; <u>Sd</u>: specialist nurses, dieticians, speech and language therapists; <u>Other</u>: staff	6 locations, West of Scotland Managed Clinical Network*: <u>MDt</u>: ENT-physician, oncologists; <u>Other</u>: staff	Support: level of technical support varied across the locations
Marshall et al. (2014)	<u>HC</u>: served as an educational tool; logistics on services not available at remote partner are discussed	<u>HC</u>: costs were an implementation barrier	Michael E. DeBakey Veterans Affairs Medical Center, Houston: <u>MDt</u>: oncologists, radiotherapist, surgeon, gastroenterologist; <u>MDd</u>: pathologists, radiologists, nuclear medicine physician; <u>Other</u>: medical administration	New Orleans (NOLA): <u>MDt</u>: oncologists, radiotherapist, pulmonologist; <u>MDd</u>: radiologist; <u>Other</u>: medical administration	HW: high-resolution VC equipment SW: Veterans Affairs linked IP-lines Room: 1th screen for real-time VC interactions, 2nd screen for sharing EMR data and case presentations Faults: audio quality slightly less than FtF
Alexandersson et al. (2018)	<u>Patient</u>: better treatment plans for complex cases <u>HC</u>: gave shared culture and common understanding of cancer pathways in the networks; medical protocol and peer-review principles were advocated	<u>HC</u>: estimated cost of VC-MDTM was higher than MDTM, but there was no account taken for reduced time for travel	University hospital, Lund: [22 MDTMs, 13 VC] <u>MDt</u>: surgeons, oncologists; <u>MDd</u>: pathologists, radiologists; <u>Sd</u>: nurses	6 county hospitals: [28 MDTMs, 11 VC] <u>MDt</u>: surgeons, oncologists; <u>MDd</u>: pathologists, radiologists; <u>Sd</u>: nurses	*Not reported*

Authors (pub year)	Benefits VC	Drawbacks VC	Cancer centre participants	Remote partner participants	VC Platform used
Van Huizen et al. (2019)	Patient: better treatment plans for complex cases due to discussion with 'fresh team' HC: kept viewpoints on medical protocols aligned in the network	HC: partner could not choose which patients to discuss due to the Dutch standard requiring the partner to discuss all patients with the centre; VC is an extra MDTM for the network	University Medical Center Groningen: MDt: ENT-, MF-surgeons, radiotherapist	Medical Centre Leeuwarden: MDt: ENT-, MF-surgeons, radiotherapist	HW: centre: 3 beamers; 5 camera inputs; 4 PCs of which 1 dedicated for PACS; remote partner: 1 PC showing data and imaging SW: 'Webex', optical fibre* bandwidth 2 Mbps Room: U-shaped table*
MDTM-Collaborate					
Hunter et al. (1999)	Web-based Patient: decreased unnecessary evacuations with cost savings HC: increased knowledge of clinical pathways for evacuation; stream-lined referral process with access to scarce facilities; served as an educational tool	HC: hindered logistics of fixed day and time 1) the day of the week (100%), or 2) the time of day (97%), or 3) low volume of interesting case presentations (100%)	Hawaii, Triple Army Medical Center: MDt: surgeon, oncologist, radiotherapist; MDd: pathologist, radiologist; Sd: psychologist, specialist nurse; Other: staff	Guam, Okinawa, Misawa, Korea, Camp Lejeune, Yokota, Yokosuka: MDt: surgeon; MDd: pathologist, radiologist; Sd: specialist nurse; Other: staff	HW: VC system, film digitizer, archive, telepathology system, web server for radiology images, workstation, conferencing telephone, digital projectors SW: net meeting desktop VC system
	ISDN HC: promoted collaboration; participants could see each other; fewer administrative tasks to get information displayed at the remote partner	HC: hindered logistics of fixed day and time 1) day of the week (95%), or 2) time of day (85%), or 3) low volume of interesting cases discussed (81%)	NC, David Grant Medical Center: MDt: surgeon, radiotherapist, oncologist; MDd: pathologist, radiologist; Sd: specialist nurse, social worker, technician; Other: staff	McClellan Air force base, Lemoore Naval: MDt: surgeon; MDd: radiologist; Sd: specialist nurse; Other: staff	HW: microscope, film digitizer, web server, PCs, conferencing telephone; camera, microphones SW: ISDN, bandwidth 384 Kbps, bridge support, PictureTel concord base codec; DICOM Faults: when network congestion telephone conferencing is used
Olver et al. (2000)	Patient: satisfied with reduced time away from home; less travel for patients HC: better understanding treatment possibilities; better treatment planning; isolated MDs felt better supported; tertiary centre reported better communication with partners; less travel for MDs; enhanced peer review; served as an educational tool	Patient: no physical examination of patient; less confidentiality (privacy) HC: not knowing each other or not knowing abilities of MDs at each site; increased workload of MDs; no reimbursement of VC	Adelaide Royal: MDt: oncologists, radiotherapist, palliative care clinicians; Sd: nurses; Other: staff	Royal Darwin Hospital: MDt: physicians, surgeons	HW: centre: camera; cameras mounted above light box; microscope for radiology and pathology; remote partner: portable VC unit Room: centre: 30-seat theatre Faults: image quality Support: logistics of displaying patient data

Authors (pub year)	Benefits VC	Drawbacks VC	Cancer centre participants	Remote partner participants	VC Platform used
Davison et al. (2004)	Patient: reduced waiting time from diagnosis to treatment; increased clinical trial accrual HC: format made case presentations more concise and complete; increased availability of thoracic surgeon opinion on recent guidelines; three weeks of surgeon travel time saved	HC: upload digital CT images had to be planned and conducted before the meeting by centre and partner	Southend District Hospital: MDt: chest medicine physician, oncologist, MDd: radiologist; Sd: specialist nurse, technician	London Chest Hospital: MDt: thoracic surgeon; MDd: radiologist	HW: Tandberg VC Vision 800; centre: Radworks CT viewing station; partner: Sony CCD camera; DXC950 above light-box SW: 3 ISDN-lines, bandwidth 384 Kbps Support: technician was necessary to adjust camera, sound and radiographs (enabling medical staff to concentrate on clinical issues)
Kunkler et al. (2006)	HC: increased size and composition of the group with less experienced, younger staff in VC vs FtF; less travel for specialists	HC: during VC there is less knowledge available from experienced MDs, possibly due to logistic changes to the MDTM and difference in attendance	Edinburgh Breast Unit: MDt: surgeons, oncologist; MDd: radiologists; Sd: specialist nurses; Other: staff	Dumfries and Galloway Royal Infirmary: MDt: surgeons; MDd: pathologist, radiologist; Sd: specialist nurses	**HW: Tandberg 2500 VC codec, twin digital projectors, networked PC, microscope and X-ray viewing system SW: ISDN-lines, NHS IP networks Room: U-form tables in room;
Kunkler et al. (2007)	Patient: VC and FtF have similar clinical effectiveness in quality of decision making HC: more core staff involved in the oncology centre VC vs FtF; less travel for specialists; better guideline compliance	HC: slightly fewer cases by VC due to technical problems	Edinburgh Breast Unit: MDt: surgeons, oncologists	Queen Margaret Hospital, Dunfermline / Fife: MDt: surgeons; MDd: pathologist, radiologist; Sd: specialist nurses	Faults: 5x no VC due to technical difficulties Support: improved access to required physical resources for VC vs FtF, but varied across locations
Stevens et al. (2012)	Patient: VC helped to decrease health disparities between urban and rural populations (improved access)	Patient: median time from diagnose to start treatment was longer (not significant)	Auckland District Health Board, VC-MDTM: MDt: surgeons, oncologists	Counties Manukau District Health Board, VC-MDTM: MDt: respiratory physicians; MDd: radiologist	*Not reported*
Murad et al. (2014)	Patient: impact on outcome through coordinated care HC: refinement of treatment through discussion; specialists at both sites have developed closer professional ties and aligned common practices; guidelines better followed for chemotherapy before and after surgery; served as an educational tool	HC: workload for oncological surgery increased threefold	NORI Hospital, Islamabad: MDt: oncologist.	Holy Family Hospital, Rawalspindi: MDt: surgeons; MDd: radiologists and pathologists	HW: Polycom VSX 7000 VTC camera, 42-inch liquid crystal display monitor SW: VC link using DSL connectivity
Novoa et al. (2016)	Patient: less travel for patients; increased frequency of thoracic surgery for new patients	HC: too many patients to discuss during VC, but not all outpatients for thoracic surgery should be discussed in VC	Healthcare Complex of the University of León*: MDt: thoracic surgeons	Thoracic Surgery of University Hospital, Salamanca*: MDt: pulmonologists, oncologists, radiotherapists	***HW: computer with microphone and webcam SW: corporate application to access each other's' computer desktop

Authors (pub year)	Benefits VC	Drawbacks VC	Cancer centre participants	Remote partner participants	VC Platform used
	HC: reduction in time for MD to see patients; reduction in duplicate tests; faster and more accurate diagnostic / treatment plans		Healthcare Complex of the University of León*: MDt: thoracic surgeons, radiotherapists	Hospital Nuestra Señora de Sonsoles de Ávila*: MDt: pulmonologists, oncologists	